

Various Issues Concerning Vendor-Managed Inventory (VMI)

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Abstract : The present market environment is very volatile and characterized by tough global competition. Technologies are changing rapidly with huge customer's demand. To handle these situations, companies need to manage innumerable requests from their stakeholders. Hence, they are under immense pressure to lower their product prices and reduce their operational costs at the same time as the demand for quick, safe and flexible deliveries from customers are increasing. In order to stay competitive and remain in market, it is essentially required to learn how to meet these requirements and fulfil the expectations of customer. Sometimes vendors are better at predicting the sales of their products in distributor's stores than the distributors. Considering this fact, vendor managed inventory (VMI) model can be a technique for providing best solution for managing orders of seasonal goods, high turn-over items or perishable products. VMI is also called continuous replenishment or supplier-managed inventory. This paper discusses about the various issues concerning about vendor-managed inventory (VMI) and emphasizing its benefits from vendors (suppliers) as well as buyers points of view.

Keywords: VMI, EDI, Supply chain, Consignment.

1. INTRODUCTION

Vendor-managed inventory (VMI) is a business model to optimize the performance of a supply chain, in which vendor (supplier) is responsible for managing the inventory of buyers. The vendor has proper access to the inventory data of buyers and is also responsible for creating purchase orders. VMI is a streamlined approach to inventory and order fulfillment. It involves partnerships between suppliers and customers that change the traditional ordering process [1]. Through VMI, the ordering process is driven by demand information sent by customers to suppliers instead of purchase orders created by customers. An important part of VMI is electronic data interchange (EDI), which helps to transfer the data electronically over a network. VMI's centralized link between suppliers and customers enables faster, less complex transactions without creating individual lines of communication for every business relationship. The VMI model provides improved supply chain visibility that enables manufacturers, suppliers and retailers to improve production planning, reduce inventory level, improve inventory turnover and improve stock availability. In VMI, distortion of demand information (known as bullwhip effect) transferred from the downstream supply chain member (retailer/customer) to the upstream member (vendor/supplier) is minimized [12]. It can be prove to an extremely effective strategy, when executed in proper manner.

2. HISTORY OF VMI

VMI became popularized in 1980s, when Wal-mart adopted this process in conjunction with Procter & Gamble. Wal-mart has achieved great success from their VMI set-up. Wal-mart developed online software to provide access of its inventory data to the vendors, which gave them a total control over replenishment of their products. VMI effectively reduces Wal-Mart's inventory levels, as each vendor is dedicate to work towards minimizing inventory and maximizing profits[6]. This adoption frees Wal-mart from having to manage P&G products and inventory at its stores.

3. WORKING OF VMI MODEL

The VMI model works as per the following important point.

- 1) Buyer provides ongoing forecast and status information.
- 2) Supplier recommends purchase volume, which is approved by buyer.
- 3) Supplier then ships the purchased items to warehouse or store.

In VMI, a supplier assumes the role of inventory planning for the customer. Extensive information sharing is required between buyer and supplier so that the supplier can maintain a high degree of visibility of its products at the customer's location [14]. The VMI requires a high level of coordination between the two entities so that the planning function tends to smoothen over time. Proprietary information is not required to be shared between the supplier and customer, but enough information for the steady flow of goods is necessary. The customer should be willing to share production schedules

and/or forecasts to provide some visibility for the supplier [13].

4. TRADITIONAL FULFILLMENT VERSUS VMI

In the traditional process, sales are typically forecast using the historical sales data. The customer forecasts orders based on the sales and inventory information available. Purchase orders are transmitted to vendor using standard EDI 850. Vendor confirms the availability to customer through EDI 855. Vendor then ships the items depending on the available inventory. An advanced shipment notification (EDI 856) is transmitted to the customer informing about the materials being dispatched. The vendor after delivery sends an invoice (EDI 810) to the customer who processes the payment through accounts payable system after performing the 3-way match.

In the VMI process, the activities of forecasting and creating purchase order are performed by the vendor instead of customer. Two EDI transactions are important in this process. First is EDI 852. That contains the sales and inventory information which is transmitted to the vendor by customer on scheduled basis, typically on daily or weekly basis. The inventory data is segmented into various groups such as 'on hand', 'on order', 'committed', and so forth. Vendor reviews the information sent by customer in EDI 852 to determine if a new order is needed. Second VMI transaction informs the customer about the order created. This can be performed using EDI 850/855. The documents contain the product number and ordered quantities of items by the vendor on customer's behalf. Vendor then generates and transmits the advanced shipment notification (EDI 856) message to customer informing the details of shipment. Following this is invoice (EDI 810) message from vendor to customer and a payment advice (EDI 820) from customer to vendor.

5. EDI DOCUMENTS USED IN VMI [3]

In above comparison different EDI numbers have been discussed, that stands for electronic data interchange (EDI). It is paperless transaction. Although electronic data interchange alone is not very effective in improving the stock outs or inventory levels but when coupled with VMI, it is very effective; hence it is an integral part of the VMI process. Some of the EDI transactions used are as below.

EDI 810 – Invoice

EDI 820 – Payment order/Remittance Advice

EDI 850 – Purchase Order

EDI 852 – Product activity data

EDI 855 – Purchase Order acknowledgement

EDI 856/857 – Advanced Shipment Notification

EDI 861 - Receipt Advice

6. BENEFITS OF VMI

VMI is a form of role reversal, to focus on its core areas, where vendor has more control over supply chain and buyer is relieved of administrative tasks, thereby increasing the supply chain efficiency [5]. It is also significantly better at responding to rogue changes in demand due to the promotion effect or to price induced variations. It has been shown that with VMI implementation two sources of the bullwhip effect

may be completely eliminated; these include rationing and gaming or the Houlihan effect, and the order batching effect or the Burbidge effect [8]. It is important to find the right balance between achieving on-time delivery and maximizing drop size from logistic view point. Too late deliveries can result in high penalties, while too early deliveries mean smaller drop sizes and thus higher long-term transportation costs. Advanced planning systems that are capable of handling sophisticated demand forecasting and order generation algorithms can prove to be the right vehicle and enabler to introduce VMI [10]. A stock replenishment delivery pattern is shown in Fig 1.

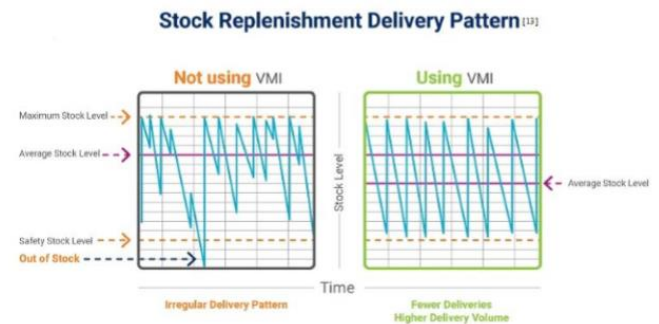


Fig: 1

7. PROBLEMS WITH VENDOR-MANAGED INVENTORY [2]

Inventory or stock management systems that are managed by the vendors are commonly used to improve inventory control along with providing efficiencies and cost reduction opportunities. It is not a perfect inventory system and suffers from some problems no other systems have. A few important demerits of VMI include the following.

- 1) VMI is dependent on the size of a business and works better for a large business. For a VMI system to work effectively and efficiently customers need to place frequent and large orders.
- 2) All the stakeholders need to be committed for the success of VMI. Trust among the stakeholders is vital for its effective operation.
- 3) For effective operations, VMI is strongly dependent on process and technology.
- 4) A VMI system often requires the vendor to make more deliveries of goods, especially if the customer prefers to keep stocks quite low and this can be problematic.
- 5) VMI requires the vendor to be more responsible as they are responsible for the delivery and finding of right quantity of items. Sometimes vendors are not geared to meet the challenges put by VMI.

8. PITFALLS IN VMI [4]

Some of the important pitfalls of a VMI system include the following:

- 1) A VMI system needs time and requires deep involvement of both parties.
- 2) The manufacturer and the distributor should have an agreement regarding overstock items or an ordering error or handling obsolete items.

- 3) Anything that adds or takes away from the normal ordering pattern must be properly communicated.
- 4) Like other systems, a VMI system also requires everyone concerned to understand and accept the new system in a receptive manner.
- 5) The manufacturer should be informed of any large customers, either gained or lost. The distributor must guide the manufacturer on how this will affect sales.
- 6) Extensive testing on EDI should be done to validate the data being sent. Is the distributor sending all the data that should be sent? Is each field populated with the correct data?

9. VMI Vs CONSIGNMENT

VMI and consignment are two different inventory strategies that are sometimes used together. VMI refers to the tasks associated with managing the inventory provided by the supplier, whereas consignment relates to the ownership of inventory. One can have that is not consignment inventory, one can have consignment inventory that is not VMI and one can have inventory that is both consignment and VMI [9]. In consignment process, product may be in the possession of the retailer but is not owned by the retailer until the sale takes place, meaning that the retailer simply houses the product in exchange for a predetermined commission or profit. It means risk and rewards remains with the first party (vendor/supplier) while the second party (distributor/retailer) is responsible for distribution or retail operations [11].

10. VMI AT DELL [7]

The world's largest computer system company the Dell Inc., bypasses retailers and sells directly to customers via phone or the Internet. Once an order is processed, it is sent to one of its assembly plants in Austin, Texas, where the product is built, tested and packaged within eight hours. Many of Dell's suppliers are located in Southeast Asia, and their shipping times to Austin range from 7 days for air transport to 30 days for water and ground transport. To compensate for these long lead times, Dell's suppliers keep inventory in small warehouses called 'revolvers' (for revolving inventory), which are a few miles from Dell's assembly plants. Dell keeps very little inventory at its plants, so it withdraws inventory from the revolvers every few hours while most suppliers deliver to their revolvers three times a week. Dell has a vendor-managed inventory (VMI) arrangement with its suppliers who decide how much to order and when to send their orders to the revolvers. Dell sets target inventory levels for its suppliers—typically 10 days of inventory—and keeps

track of how much suppliers deviate from these targets and reports this information back to suppliers.

11. CONCLUSIONS

The trading partners can maximize their profits by collaborating and integrating business processes. In general vendor and customer focus on 'how to sell more', but in a VMI model, vendor focus shifts from 'how to get customer to buy more' to 'how to help Customer sell more'. Accurate information flow is the key to success of VMI. The EDI technology as well as effective team work and strong participation can lead to huge cost saving.

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